Sumin Kang

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EDUCATION

Virginia Polytechnic Institute and State University (Virginia Tech), Blacksburg, VA
Ph.D., Department of Industrial and Systems Engineering, (2021–2025 (expected))
- *Advisor*: Dr. Manish Bansal

Korea Aerospace University, Goyang, Gyeonggi-do, Republic of Korea
M.S., Department of Air Transport, Transportation, and Logistics, (2015–2017)
B.S., Department of Air Transport, Transportation, and Logistics, (2012–2015)
Graduated with Highest Honors (1^{st} ranked)

RESEARCH INTERESTS

- **Methodology:** *Stochastic Optimization; Integer Programming; Distributionally Robust Optimization; Sequential Decision Making*
- **Application:** *Network Optimization; Network Interdiction (Attacker-Defender Network Optimization); Transportation and Logistics; Graph Neural Network*

HONORS AND AWARDS

- Travel Award, The Sanghani Center for Artificial Intelligence and Data Analytics, Virginia Tech (2023)
- Mixed Integer Programming (MIP) Workshop Travel Award (for selected presenters) (2022 & 2023)
- Outstanding Paper Award, Korea Logistics Society Spring Conference (2017)
- National Science and Engineering Undergraduate Scholarship, Korea Student Aid Foundation (2014–2015)
- Winner of Capstone Design Competition, Korea Aerospace University (2014)
- Dean's Scholarship (1^{st} ranked student), Korea Aerospace University (2012–2016)

JOURNAL PUBLICATIONS

Journal Publications (Published/Accepted)

1. **S. Kang** and M. Bansal, "Distributionally risk-receptive and risk-averse network interdiction problems with general ambiguity set," *Networks* 81(1), 3-22, 2022. [link]
2. **S. Kang**, M. Kim, and J. Chae, "A closed loop based facility layout design using a cuckoo search algorithm," *Expert Systems with Applications* 93, 322-335, 2018.
3. **S. Kang** and J. Chae, "Harmony search for the layout design of an unequal area facility," *Expert Systems with Applications* 79, 269-281, 2017.
4. **S. Kang** and J. Chae, "A harmony search based algorithm for facility layout design with mixed type departments," *Korean Journal of Logistics* 23.4, 1-15, 2015.

Unpublished Preprints

1. **S. Kang** and M. Bansal, "Distributionally ambiguous multistage stochastic integer and disjunctive programs: applications to sequential two-player interdiction games,"
Optimization Online, 2023. [link]

SKILLS

- **Programming Language**: Python, Java, Julia, AMPL
- **Software Packages**: Gurobi, CPLEX

TEACHING EXPERIENCE

Teaching Assistant in Virginia Tech

- ISE 2404: Deterministic Operations Research I, Spring 2024.
- ISE 5405: Optimization I (Linear Programming, AMPL/Gurobi Tutorial), Fall 2023.
- ISE 3424: Discrete-Event Simulation, Spring 2021.

Teaching Assistant in Korea Aerospace University

- AT 4352: Analysis of Logistics System, 2015 & 2016.
- AT 3202: Operations Research I (Linear Programming), Grader, 2015 & 2016.

PRESENTATIONS

- Distributionally ambiguous multistage stochastic integer and disjunctive programs: applications to sequential two-player interdiction games
  - *INFORMS Annual Meeting 2023*, Phoenix, 2023
  - *MIP Workshop*, Los Angeles, 2023 (Poster)
- Solution approaches for distributionally robust mixed-integer programs
  - *INFORMS Annual Meeting 2022*, Indianapolis, 2022
- Distributionally risk-receptive and risk-averse network interdiction problems with general ambiguity set
  - *INFORMS Annual Meeting 2022*, Indianapolis, 2022
  - *MIP Workshop*, New Brunswick, 2022 (Poster)
  - *INFORMS Optimization Society Conference*, Greenville, 2022
  - *INFORMS Conference on Security*, Arlington, 2022
- Attacker-defender maximum coverage location problem with partial coverage and spatial demand
  - *INFORMS Conference on Security*, Arlington, 2022
  - *INFORMS Annual Meeting 2021*, Virtual, 2021
- A closed loop based facility layout design using cuckoo search methodology
  - *Decision Science Institute (DSI) Annual Meeting 2016*, Austin, 2016.
- A slicing tree representation and harmony search based heuristic algorithm for unequal area facility layout design
  - *DSI Annual Meeting 2015*, Seattle, 2015

PROFESSIONAL SERVICE AND LEADERSHIP

- **Session Chair**
  - INFORMS Annual Conference 2022; INFORMS Optimization Society Conference 2022; INFORMS Conference on Security 2022
- **Journal Reviewer**: Networks; Optimization Letters
- **Professional Memberships**
  - Institute for Operation Research and the Management Sciences (INFORMS)
  - Society for Industrial and Applied Mathematics (SIAM)
  - Affiliated Student at the Sanghani Center for Artificial Intelligence & Data Analytics, Virginia Tech
- **Leadership and Education Initiatives**:
  - Established a programming club in Korea Aerospace University and instructed Python and AutoMod.
  - Supervised a project that won the first prize in 12^{th} Undergraduate Project Contest from Society of Korea Industrial & Systems Engineering [link]

PROJECTS

- Automotive Research Center (ARC), 2021-2023, "Novel Algorithms for Multi-agent Autonomous Telerobotic Surveillance and Reconnaissance System." Developed decomposition algorithms for stochastic integer programs with applications to attacker-defender network problems.
- Incheon International Airport Corporation, 2020, "Simulation Analysis of Terminal at I Airport"
- Nexen Tire, 2019-2020, "Real-time Allocation Algorithm for On-demand Transportation System"
- Korea Airports Corporation, 2019, "Simulation Analysis of Baggage Handling System of K Airport"